



Photo 1 Tropical Forages Program (CIAT)

# Sustainable Beef Production with Forage Associations in the American Tropics

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This poster is being presented at "Tropentag 2016: Solidarity in a competing world — fair use of resources"; September 18 - 21 2016, Vienna, Austria

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## INTRODUCTION

- In 2006, Colombia launched its Strategic Plan for Livestock Production (PEGA 2019) aiming at a reduction of the total area under pasture by 10 million ha until 2019
- To achieve this goal, the current production systems, characterized by strong seasonality and a low offer in feed quality and quantity, need to be transformed into more sustainable production systems with higher animal productivity and resilience to changing environmental conditions
- Improved forages such as grasses and (herbaceous and shrub) legumes are viable alternatives for livestock systems in adverse environmental conditions (e.g., extreme droughts or floodings, high aluminium saturation in soils) contributing to higher animal productivity, feed availability and environmental sustainability



Photo 2 Toledo associated with native trees in Cauca, Colombia by Neil Palmer (CIAT)

## OBJECTIVES

Measuring animal live weight gains in grass-legume forage associations with the aim to:

- Identify the forage effect on the animal, expressed in animal productivity per unit area
- Validate the persistence of (herbaceous and shrub) legumes under grazing

## MATERIALS & METHODS

- Experiment conducted at the CIAT trial fields in Palmira, Colombia
- Completely randomized block design, three treatments with three repetitions were sown and evaluated for daily animal live weight gains between 2014 and 2015:
  - ✔ T1: Pasture *Brachiaria brizantha* cv. Toledo as monoculture
  - ✔ T2: Pasture *Brachiaria brizantha* cv. Toledo associated with herbaceous legume *Canavalia brasiliensis*
  - ✔ T3: Pasture *Brachiaria brizantha* cv. Toledo associated with herbaceous legume *Canavalia brasiliensis* and shrub legume *Leucaena diversifolia*
- After establishment: Rotational grazing with 15 commercial animals (male Zebu, 5 per treatment, initial live weight = 200 kg)

## ACKNOWLEDGEMENTS

This work was done as part of the CGIAR Research Program on Livestock and Fish

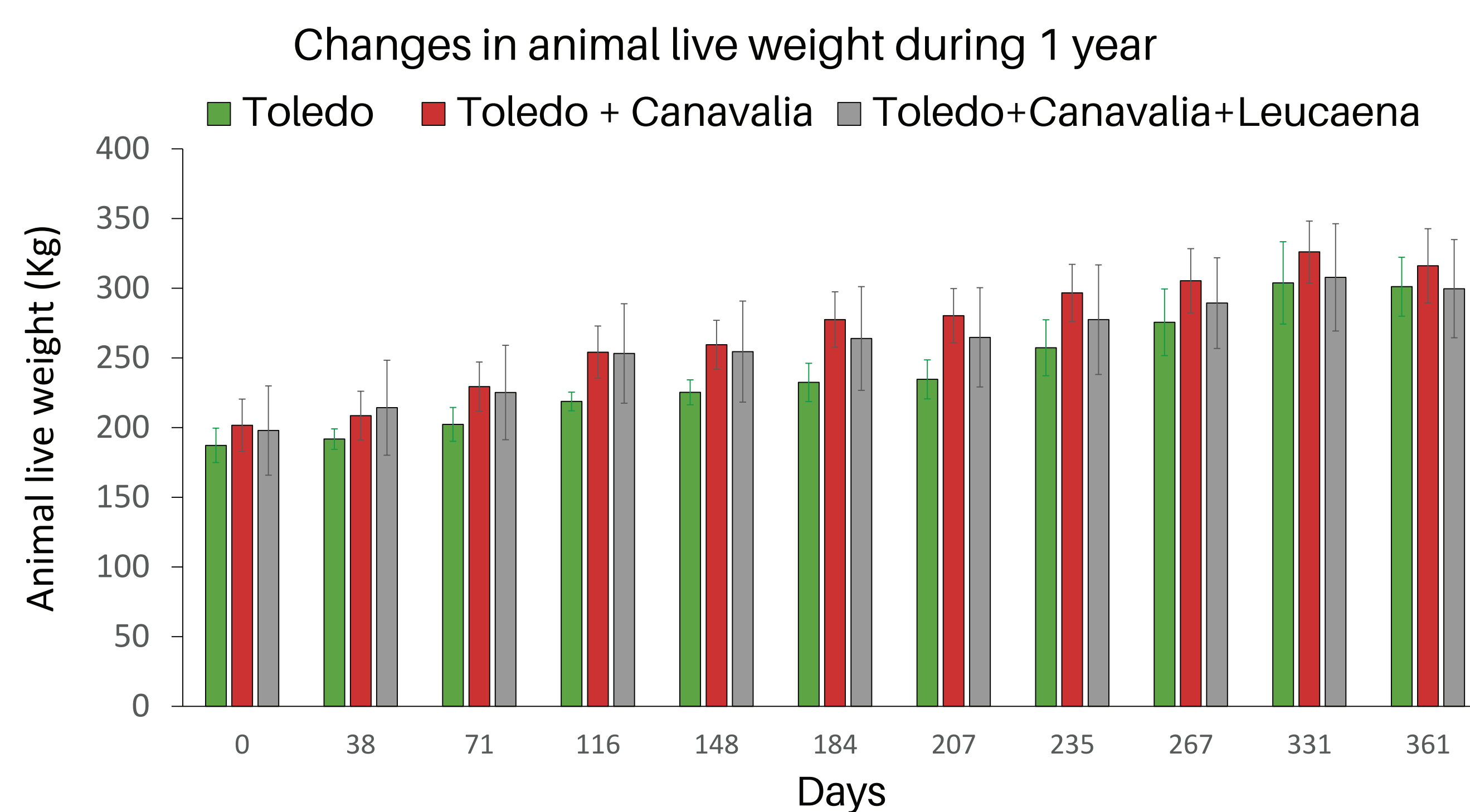
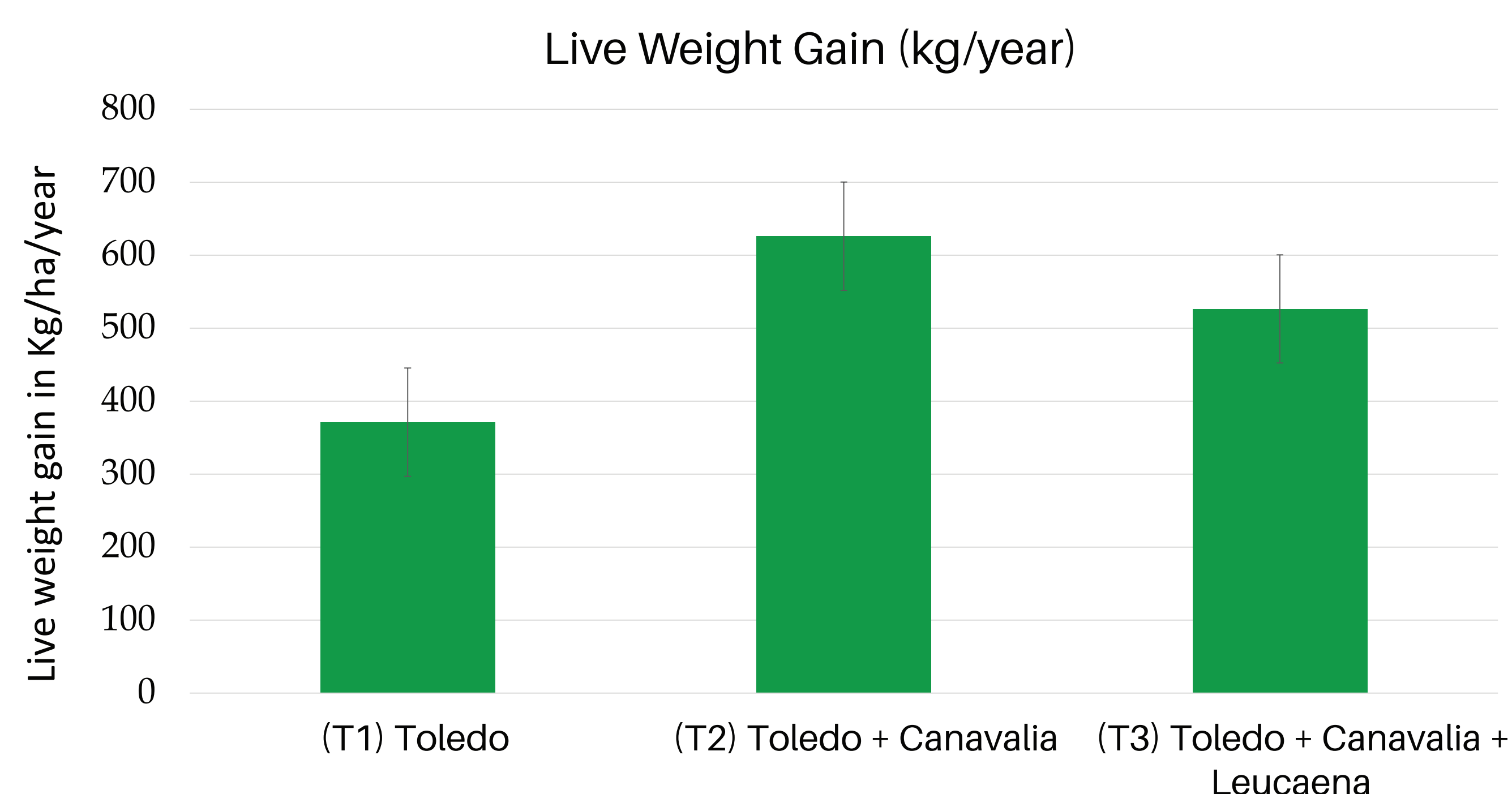
This work was undertaken as part of the CGIAR Research Program on Climate Change, Agriculture and Food Security (CCAFS), which is a strategic partnership of CGIAR and Future Earth

We thank all donors that globally support our work through their contributions to the CGIAR system

## REFERENCES

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## RESULTS



- Animals grazing *Brachiaria brizantha* cv. Toledo associated with the legume *Canavalia brasiliensis* (T2) showed the highest individual daily weight gains: 380 g, 125 g more than those grazing *Brachiaria brizantha* cv. Toledo only (T1)
- Animals grazing grass-legume associations (T2 and T3) show higher per area live weight gains (554 and 526 kg/year) than those grazing *Brachiaria brizantha* cv. Toledo only (T1; 371 kg/year)
- The higher per area productivity of grass-legume associations is related to both forage quantity and quality

## CONCLUSIONS

Grass-legume forage associations can:

- Be a valuable option for livestock producers for achieving higher productivity levels and for increasing resilience to changing environmental conditions
- Contribute to sustainable intensification of livestock production systems by producing more meat per unit area
- Contribute to the compliance with national sustainability plans and strategies